SUPPORT FOR THE AMENDMENT

The amendments to the claims are supported by the claims as originally filed, and at page 5, line 14 to page 6, line 27. No new matter is believed to be added by entry of these amendments. Claims 1, 2, 5-19, and 21-35 are active.

REMARKS

Applicants would like to thank Examiner Gray for the helpful and courteous discussion held with Applicants' representative on November 20, 2002. During the discussion, Applicants pointed out that Graves fails to describe glass or mineral wool comprising glass or wool fibers which are soluble in a psychological medium *and* have 8-25 wt% of an alkali metal oxide, or describe a hydrophilic latex or a hydrophilic protective colloid.

The rejection of the claims under 35 U.S.C. §§102(b) or 103(a) Graves is respectfully traversed. Graves describes insulation products in which the glass or mineral wool is treated with a size and a fire resistant latex. The fire resistant latex of Graves is an emulsion of a thermoplastic polymer which is "halogenated and preferably also carboxylated" (column 7, lines 12-50). However, Graves fails to indicate the extent to which the thermoplastic polymer is carboxylated. Graves provides two examples of latex polymers, both of which are prepared from monomers lacking a hydrophilic functional groups. For example, the D249 latex of Graves is a carboxylated vinylidene chloride/butadiene polymer, and the A4530 latex is an ethylene/vinyl chloride polymer (column 16, lines 52-59). Applicants respectfully submit that the degree of carboxylation of the D249 polymer is reasonably less than 100% because of the well known difficulty in quantitatively functionalizing a polymer. In addition, the A4530 polymer does not have the hydrophilic groups of the claimed invention. Thus, at

least some of the monomer units of the latex polymers exemplified by Graves would reasonably lack a hydrophilic functional group. In contrast, the claimed hydrophilic latex is a dispersion or emulsion of a polymer prepared from one or more monomers "*each* having at least one hydrophilic functional group" (emphasis added). Thus, the dispersed or emulsified polymer of the present invention is quite different from the latex polymers of Graves, and would be expected to provide quite different properties to an insulation product. As discussed, for example at page 5, lines 9-13 of the present specification, the hydrophilic lattices of the present invention provide insulation products with superior ageing performance in wet environments.

Alternatively, the latex of the present invention may comprise a dispersion or emulsion of a homopolymer or copolymer, and a protective colloid having hydrophilic functional groups. Applicants note that Graves lacks a description of a latex comprising a protective colloid of any type, particularly a protective colloid having hydrophilic functional groups, and therefore Graves neither describes or suggests the hydrophilic protective colloid of the present invention.

In addition, the mineral wool of the insulation product of the present invention may comprise fibers which are soluble in a physiological medium *and* have about 8 to 25% by weight of an alkali metal oxide. Graves fails to describe such glass fibers. The mineral wool of Graves "comprises oxides of silicon, aluminum, calcium, and magnesium, and other mineral oxides", and these glass fibers are comprised "primarily of oxides of silicon, but oxides or other minerals such as magnesium and aluminum are often present in relatively low concentrations" (column 9, lines 37-67). None of these components are oxides of an alkali metal. Thus, Applicants respectfully submit that Graves fails to describe or suggest a mineral wool which is both soluble in a physiological medium *and* has 8-25% of an alkali metal oxide.

As discussed above, the claimed inventions have a hydrophilic latex comprising either a latex polymer or copolymer having at least one hydrophilic functional group on each monomer unit, or a latex polymer emulsified with a protective colloid having hydrophilic functional groups. Graves fails to describe either the hydrophilic latex polymer or a latex having the protective colloid with hydrophilic functional groups of the claimed invention. As discussed throughout the present specification (e.g., at page 3, line 32 to page 4, line 11, and page 6, line 38 to page 7, line 4), the hydrophilic latex of the present invention provides improved binding of the size to the mineral wool fibers, and thereby provides an insulation product having improved properties. Accordingly, Graves neither anticipates nor suggests such a latex.

Furthermore, the insulation product of the present invention may comprise a mineral wool which is soluble in a physiological medium and has 8-25 wt% of an alkali metal oxide. As discussed above, Graves fails to describe such a glass wool. Accordingly, Graves neither anticipates nor suggests the insulation product or method of the present invention.

The rejection of the claims under 35 U.S.C. § 112, second paragraph are obviated by appropriate amendment. The claims have been amended to conform to U.S. practice, and phrases such as "such as", "especially", "particularly", and "type" have been deleted.

In addition, the specification and abstract have been amended as suggested by the Examiner. In regard to the trademark VINNOL, Applicants note that the generic composition of VINNOL has been described at page 14, lines 9-12.

Accordingly, and for the reasons stated above, Applicants respectfully request withdrawal of the rejections. Early notification thereof is earnestly solicited.

Respectfully submitted,

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IN THE SPECIFICATION

Please amend Table 1 at page 17 to read as follows:

Table 1

Example 1 % latex/glass	Immersion water uptake kg/m^3	Friability %			Puncture strength (N)		
		As manu-factured	Aged	Loss	As manu-factured	Aged	Loss
0%, reference	19	2.7	20	17.3	178	61	-65%
1% [Vinnol] VINNOL	19	2.9	10 (-50%)	7.1	187	90 (+49%)	-52%
2% [Vinnol] VINNOL	23	3.5	11 (-45%)	7.5	184	90 (+49%)	-51%

Example 1 % latex/glass	Tear strength (kPa)			10% compressive strength (kPa)			25% compressive strength (kPa)		
	As manu-factured	Aged	Loss	As manu-factured	Aged	Loss	As manu-factured	Aged	Loss
0%, reference	14.2	3.4	-76%	19	12	-36%	50	23	-54%
1% [Vinnol] VINNOL	13.6	5.5 (+62%)	-59%	20	13 (+8%)	-35%	47	27 (+17%)	-42%
2% [Vinnol] VINNOL	11.4	4.8 (+41%)	-57%	19	13 (+8%)	-31%	45	27 (+17%)	-48%

Please amend Table 2 at pages 18 and 19 to read as follows:

Table 2

% latex/glass	Immersion water uptake kg/m^3	Friability %			Puncture strength (N)		
		As manu-factured	Aged	Loss	As manu-factured	Aged	Loss
Example 2							
0%, reference	23	3.2	21	17.8	188	59	-69%
2% [Vinnol] VINNOL	22	3.1	9.2 (-56%)	6.1	192	78 (+32%)	-59%
Example 3							
0%, reference	23	2.8	16.3	13.5	193	78	-59%
2% [Vinnol] VINNOL	20	3.4	11.1 (-32%)	7.7	189	113 (+45%)	-40%

% latex/glass	Tear strength (kPa)			10% compressive strength (kPa)			25% compressive strength (kPa)		
	As manu-factured	Aged	Loss	As manu-factured	Aged	Loss	As manu-factured	Aged	Loss
Example 2									
0%, reference	10.7	unmeas-urable	$\simeq$-100%	19	10	-47%	45	20	-55%
2% [Vinnol] VINNOL	8.9	3	-66%	17	16 (+16%)	-6%	41	24 (+20%)	-56%
Example 3									
0%, reference	12.6	4.6	-63%	20	13	-36%	49	26	-47%
2% [Vinnol] VINNOL	10.8	5.2 (+13%)	-52%	19	14 (+8%)	-31%	47	31 (+19%)	-34%

Please amend the paragraph at page 22, lines 31-33 to read as follows:

- Ex 11: a silanized styrene/acrylic ester copolymer sold by Wacker under the reference [Vinnapas] VINNAPAS LL6030 (film-forming temperature of 24°C);

Please amend the paragraph at page 22, lines 34-37 to read as follows:

- Ex.12: a vinyl chloride/ethylene copolymer sold by Wacker under the reference [Vinnol] VINNOL CE 752 (film-forming temperature of 7°C). This is a hydrophobic latex.

IN THE CLAIMS

--1. (Amended) A method [Method] of improving the mechanical strength after ageing[, particularly in a wet medium,] of an insulation product[, especially a thermal and/or acoustic insulation product, based on] comprising mineral wool, comprising:

applying [provided with] a size comprising a thermosetting resin to the mineral wool, [especially a phenolic resin, in which method a]

applying a hydrophilic latex [is added to the size during the manufacture of the product] to the mineral wool, then

thermally curing the size,

wherein the hydrophilic latex comprises a dispersion or emulsion of homopolymer or copolymer prepared from one or more monomers each having at least one hydrophilic functional group selected from the group consisting of hydroxyl, carboxyl and ester, or

the hydrophilic latex comprises a dispersion or emulsion of a homopolymer or copolymer and a protective colloid having hydrophilic functional groups.

2. (Amended) The method [Method] according to Claim 1, [in which the product is based on] wherein the mineral wool [capable of dissolving] dissolves in a physiological medium, [especially containing a proportion of alkali metal oxides of about 8 to 25% by weight of the wool].

5. (Amended) The method [Method] according to Claim [3 or 4] 1, [in which] wherein the [latex contains a] homopolymer or copolymer is selected from the group consisting of [which is of the] vinyl [type] polymers, [especially a] vinyl acetate homopolymers or copolymers, [or of the] acrylic polymers [type and/or which is derived from a] and carboxylic acid containing polymers.

6. (Amended) The method [Method] according to Claim 5, [in which] wherein the [latex is chosen from:] homopolymer or copolymer is selected from the group consisting of [-

] a polyvinyl acetate homopolymer, a vinyl acetate/ (meth) acrylic acid or ester copolymer, a vinyl acetate/maleic ester copolymer, a vinyl acetate/olefin copolymer, a vinyl acetate/vinyl chloride copolymer[;],[-] a silanized acrylonitrile/acrylic ester, [or] and a silanized styrene/acrylic acid or ester copolymer.

7. (Amended) The method [Method] according to [one of] Claim[s] 1 [to 3], [in which] wherein the latex is [based on] an aqueous dispersion or emulsion of [particles consisting of] a homopolymer or copolymer [surrounded by a surfactant or by] and a protective colloid having hydrophilic functional groups[, especially one based on polyvinyl alcohol or on cellulose].

8. (Amended) The method [Method] according to Claim 7, [in which] wherein the latex comprises a copolymer and a protective colloid, and the copolymer is selected from the group consisting of a silanized or non-silanized vinyl chloride/ethylene copolymer [or] and a silanized or non-silanized vinyl chloride/vinyl laurate/ethylene terpolymer.

9. (Amended) The method [Method] according to [any one of] Claim[s] [3 to 8] 1, [in which] wherein the latex further comprises a water-repellent agent[, such as a silicone or a fluorinated compound, is added to the latex].

10. (Amended) The method [Method] according to [any one of the preceding claims] Claim 1, [in which] wherein the [latex is based on a] homopolymer or copolymer has [having] a glass transition temperature T_g of less than 80°C [and especially of less than 50°C].

11. (Amended) The method [Method] according to [any one of the preceding claims] Claim 1, [in which] wherein the [latex is based on a] homopolymer or copolymer has [having] a glass transition temperature T_g of greater than -5°C [and especially of greater than 0°C].

12. (Amended) The method [Method] according to [any one of the preceding claims] Claim 1, [in which the solids content of] wherein after said curing, the solids content of the

hydrophilic latex [introduced] is less than 5%[, especially about 0.01 to 5%,] by weight with respect to the weight of mineral wool.

13. (Amended) The method [Method] according to [any one of the preceding claims] Claim 1, [in which] wherein the hydrophilic latex is mixed with the size before application to the mineral wool.

14. (Amended) The method [Method] according to [any one of] Claim[s] 1 [to 12], [in which] wherein the hydrophilic latex is applied to the mineral wool separately from the size.

15. (Amended) An insulation [Insulation] product[, especially a thermal and/or acoustic insulation product, based on] prepared by applying [mineral wool provided with] a size [based on] comprising a thermosetting resin[, especially a phenolic resin, in which the size contains] to a mineral wool, applying a hydrophilic latex to the mineral wool, then thermally curing the size[which improves the mechanical strength of the product after ageing, particularly in a wet medium],

wherein the hydrophilic latex comprises a dispersion or emulsion of homopolymer or copolymer prepared from one or more monomers each having at least one hydrophilic functional group selected from the group consisting of hydroxyl, carboxyl and ester, or

the hydrophilic latex comprises a dispersion or emulsion of a homopolymer or copolymer and a protective colloid having hydrophilic functional groups.

16. (Amended) The insulation [Insulation] product according to Claim 15, [in which] wherein the mineral wool [consists of] comprises glass or rock wool [capable of dissolving] which dissolves in a physiological medium[, especially containing a proportion of alkali metal oxides of about 8 to 25% by weight of the mineral wool].

17. (Amended) The insulation [Insulation] product according to Claim 16, [in which] wherein the mineral wool dissolves in a saline solution simulating a physiological medium at

a rate of at least 30 [and especially at least 40 or 50] ng/cm^2 per hour, measured at pH 4.5, and at a rate of at least 30 [and especially at least 40 or 50] ng/cm^2 per hour, measured at pH 7.5.

18. (Amended) The insulation [Insulation] product according to [one of] Claim[s] 15 [to 17], [which] wherein the insulation products has a density of at least 30 kg/m^3[, especially at least 50 kg /m^3 and particularly at least 80 kg/m^3].

19. (Amended) [Use of a latex with a size for an insulation product, especially a] The insulation product of Claim 15, wherein the insulation product is a thermal and/or acoustic insulation product[, based on mineral wool, in order to improve the mechanical strength after ageing, particularly in a wet medium, of the product].

21. (Amended) [Sizing] A sizing composition [for an insulation product, especially a thermal and/or acoustic insulation product,] comprising a thermosetting resin and a hydrophilic latex,

wherein the hydrophilic latex comprises a dispersion or emulsion of homopolymer or copolymer prepared from one or more monomers each having at least one hydrophilic functional group selected from the group consisting of hydroxyl, carboxyl and ester, or

the hydrophilic latex comprises a dispersion or emulsion of a homopolymer or copolymer and a protective colloid having hydrophilic functional groups.

Please cancel Claims 3, 4 and 20 without prejudice.

22-35. (New).--

IN THE ABSTRACT

Please amend the Abstract to read as follows:

[PATENT

METHOD OF IMPROVING THE MECHANICAL STRENGTH OF AN INSULATION PRODUCT BASED ON MINERAL WOOL, INSULATION PRODUCT AND SIZING COMPOSITION

Filed by: ISOVER SAINT-GOBAIN]

ABSTRACT

In order to improve the mechanical strength after ageing[, particularly in a wet medium,] of [an] a mineral wool insulation product, [especially a thermal and/or acoustic insulation product] particularly in a wet medium, [based on mineral wool provided with a size,] a hydrophilic latex comprising a dispersion or emulsion of a polymer prepared from monomers each having a hydrophilic functional group, or a dispersion or emulsion of a polymer and a hydrophilic protective colloid is incorporated in the sizing composition [which contains especially a phenolic resin]. The presence of the hydrophilic latex or protective colloid allows the loss of mechanical performance after ageing to be very considerably reduced. The mineral wool may include those which dissolve in a physiological medium and have 8-25% by weight of at least one alkali metal oxide. [The sizing composition advantageously comprises a latex based on an aqueous dispersion or emulsion of a polymer phase carrying hydrophilic functional groups.

Application to the manufacture of insulation products intended to be exposed to atmospheric condensation and/or based on mineral wool of lower hydrolytic resistance.

Fig. None]